Advance Policy Questions for Zachary J. Lemnios
Nominee for the Position of Director of Defense Research and Engineering

Duties

What is your understanding of the duties and functions of the Director of Defense Research and Engineering?

The DDR&E is the principal staff advisor to the Under Secretary of Defense (AT&L) and to the Secretary and Deputy Secretary of Defense for research and engineering matters. The DDR&E serves as the Chief Technology Officer for the Department of Defense.

What background and experience do you possess that you believe qualifies you to perform these duties?

I have over 30 years of professional experience as an engineer. During my career, I have served in both industry and government, and am currently in an academic laboratory. I have also served on many Defense Science Boards and other advisory committees. If confirmed, I believe that my background and experience will enable me to discharge the DDR&E's responsibility to develop technologies that enhance the operational capabilities required by our armed forces.

Do you believe that there are actions you need to take to enhance your ability to perform the duties of the Director of Defense Research and Engineering?

I believe that I have the necessary background, skills, and ability to perform the duties of the Director of Defense Research and Engineering.

Assuming you are confirmed, what duties and functions do you expect that the Secretary of Defense will assign to you?

If confirmed, I expect the Secretary to assign me duties and functions commensurate with those of a Chief Technology Officer, and any others as he may deem appropriate.

Relationships

Section 139a of title 10, United States Code, and DOD Directive 5134.3 discuss the responsibilities and functions of the Director of Defense Research and Engineering. Other sections of law and traditional practice also establish important relationships outside the chain of command. Please describe your understanding of the relationship of the Director of Defense Research and Engineering with the following:

A. The Deputy Secretary of Defense.

If confirmed, I will work closely with the Deputy Secretary to provide advice and assistance commensurate with the role of a Chief Technology Officer, including rapidly transitioning technology to the field, prioritizing science and technology investment funding levels, and enhancing current and future military capabilities.

B. The Under Secretary of Defense for Acquisition, Technology, and Logistics

The DDR&E is subject to the authority, direction and control of the USD(AT&L). If confirmed, I expect to provide the OUSD(AT&L) with technology insight and leadership across the research and engineering community.

C. The Under Secretary of Defense for Intelligence

If confirmed, I will work to foster a close working relationship with the Under Secretary of Defense for Intelligence to ensure our research and engineering needs are synchronized across the Department. I believe intelligence on potential adversary capabilities is important for sharing among the defense programs.

D. The Under Secretary of Defense (Comptroller/Chief Financial Officer)

If confirmed, I will work closely with the Under Secretary of Defense (Comptroller/Chief Financial Officer) to ensure investment in research and engineering meets the overall priorities of the Department.

E. The Under Secretary of Defense for Personnel and Readiness

If confirmed, I will work to foster a close working relationship with the Under Secretary of Defense for Personnel and Readiness to ensure the current and future research and engineering workforce priorities are balanced across the Department, and to ensure that technologies necessary for the readiness of our forces are in the DoD portfolio.

F. The Service Secretaries

If confirmed, I will work to foster a close working relationship with the Service Secretaries to ensure their research and engineering priorities and technology investments are supporting the overall Department goals and are in balance.

G. The Service Acquisition Executives

Research and Engineering is the first step in the overall acquisition process, so I view the Service Acquisition Executives as a primary customer of defense research and engineering. If confirmed, I will work closely with the Service Acquisition Executives on research and engineering matters to provide technology leverage for their missions.

H. The Service Science and Technology Executives

The Service S&T Executives are responsible for developing and executing the programs for their respective Service. If confirmed, I intend to provide technical insight and work closely with them to ensure the overall DoD S&T investment is coordinated and provides the best possible payoff for taxpayer investment.

I. The Directors of Department of Defense Laboratories and Research Centers.

If confirmed, I intend to work closely with the Directors of Defense Laboratories and Research Centers to provide them with the necessary resources to deliver technology in support of DoD needs. I also believe it is the responsibility of the DDR&E to establish standards for lab performance.

J. The Director of the Defense Advanced Research Projects Agency

If confirmed, I will work closely with the Director of Defense Advanced Research Projects Agency (DARPA) to ensure that DARPA continues to open new technical fields and create new technologies that have a profound impact on national security.

K. The Director of the Defense Threat Reduction Agency

If confirmed, I will work with the Director of the Defense Threat Reduction Agency on research and engineering matters pertaining to weapons of mass destruction.

L. The Joint Staff

Research and Engineering provides new operational capability options to the warfighter. I view the Joint Staff as another primary customer of research and engineering products. If confirmed, I will work closely with the Joint Staff on issues relating to research and engineering with the goal of understanding the requirements process and specific capability needs in order to ensure our warfighters are affordably equipped with superior warfighting capabilities.

M. The Director, Defense Test Resource Management Center

If confirmed, I will work with the Director, Defense Test Resource Management Center to consider technology options and alternate procedures for enhancing the test and evaluation of DoD systems.

N. The Director, Operational Test and Evaluation

If confirmed, I will work with the Director, Operational Test and Evaluation to consider technology options and alternate procedures for enhancing the test and evaluation of DoD systems.

O. The Director of the Joint Improvised Explosive Device Defeat Office

If confirmed, I will work with the Director of the Joint Improvised Explosive Device Defeat Office to identify technical and system solutions for defeating current threats and countering future anticipated threats.

P. The Assistant Director of Defense for Networks and Information Integration

If confirmed, I will work closely with the Assistant Director of Defense for Networks and Information Integration to ensure enhanced communication and network capabilities and cyber protection.

Q. The Director of the Business Transformation Agency

If confirmed, I will work with the Director of the Business Transformation Agency on issues regarding research and engineering business practices and efficiencies.

R. The Director of the White House Office of Science and Technology Policy

If confirmed, I will work closely with the Director of the White House Office of Science and Technology Policy to ensure DoD research and engineering goals and priorities are aligned with the Administration's goals and priorities.

Major Challenges

In your view, what are the major challenges that will confront the Director of Defense Research and Engineering?

The first major challenge is to preserve the technological edge of current U.S. forces, by extending the capabilities of our war fighting systems – through better intelligence, greater speed, longer range, higher precision, and more effectiveness. The second major challenge is to identify breakthrough capabilities, allowing the U.S. to leapfrog potential adversaries. Finally, the third major challenge is to provide a hedge against an uncertain future via a set of scientific and engineering options that provide technological depth to U.S. capabilities and deterrence against strategic surprise.

Assuming you are confirmed, what plans do you have for addressing these challenges?

If confirmed, I will develop plans that address these challenges by enhancing the capability of defense science and technology to deliver to the warfighter and to the American taxpayer technologies and systems that provide increased agility or the ability to adapt to changing applications and environments, the ability to scale flexibly with demand, and the ability to react faster than adversaries with minimal support and logistics infrastructure.

What do you consider to be the most serious problems in the performance of the functions of the Office of the Director of Defense Research and Engineering?

I do not believe I can fairly answer this question from my current vantage point.

If confirmed, what management actions and time lines would you establish to address these problems?

I do not believe I can fairly answer this question from my current vantage point, but if confirmed, I will develop a plan to assess any problems that may exist and then implement actions to correct them.

Priorities

If confirmed, what broad priorities would you establish in terms of issues which must be addressed by the Director of Defense Research and Engineering?

If confirmed, I will work with the Under Secretary of Defense for Acquisition, Technology, and Logistics and The Joint Chiefs of Staff to more fully understand the technology opportunities and needs of the warfighter and Department Acquisition Programs. In general, I would expect the priorities would be consistent with the priorities defined by Defense Secretary Gates in the last two budget cycles. Last year, the Secretary specifically directed an increase in spending for Defense Basic Research, and has indicated this remains a priority. I would expect the other broad priorities would be consistent with the three priorities laid out by the Secretary in his April 2009 budget rollout speech. In that speech, the Secretary said DoD would:

1. *Take care of our people*
2. *Develop capabilities to fight today's war and prepare for future wars*
3. *Reform the way we acquire weapons systems*

If confirmed, I would expect my priorities to be consistent with these broad priorities of Secretary Gates.

What defense technologies do you consider the highest priorities for development in order to enhance DOD's ability to prosecute its designated missions?

In general, I believe it is difficult to provide a single list of technologies that have "highest priority." It has been my experience that an effective S&T program balances near and long term activities and balances incremental change with revolutionary technologies. The highest priorities should develop or deliver a capability advantage for our deployed forces. During my two tours at DARPA, I saw significant technologies such as the internet, UAV's, stealth, and others emerge from DoD investments in advanced technologies. Prospectively, I believe we should understand where the state of the art is in science, and understand how to apply these technologies, and create opportunities through investment.

What will be your strategy for developing these technologies in a manner to support needed defense capabilities in a timely and cost effective way?

If confirmed, I will look at all available strategies and evaluate them against the constraints of being timely and cost effective.

Investment in Science and Technology

If confirmed, what metrics will you use to assess the size and portfolio of investments made under the defense science and technology (S&T) program?

Determining a sufficient level of Science and Technology (S&T) investment is not a precise science; rather, it is a strategic decision. The goal should be to fund S&T at a level adequate to ensure the technological superiority of our armed forces. A strong S&T program is required to provide options for responding to a full range of military challenges both today, and into the future.

What role should the Director of Defense Research and Engineering play in the detailed development and coordination of service and agency S&T investment strategies, programs, and budgets?

Each Service and agency has a responsibility to plan, program, and execute S&T programs to meet their specific component's needs. The Director of Defense Research & Engineering should provide investment and management guidance that integrates Service and agency efforts to provide a full spectrum of DoD capabilities. Each of the Services' and agencies' S&T programs should leverage and complement each others' efforts.

What, in your view, is the role and value of S&T programs in meeting the Department's transformation goals and in countering irregular, catastrophic, traditional, and disruptive threats?

The Department's investment in S&T develops the technological foundation necessary for our modernization effort, and fosters the development of "leap ahead" technologies that produce transformational capabilities on our terms. DoD must continue to invest broadly in defense-relevant technologies as a hedge against technological surprise and as a counter to future threats.

Are there any S&T areas that you view as underfunded by the Department?

I do not know of any S&T areas that are underfunded. If confirmed, I will perform an assessment of the entire DoD S&T portfolio, and make an assessment at that time.

In your judgment, will the funding levels in these areas affect the Department's ability to meet the threats of the future?

I am not aware of any specific science or technology areas that are underfunded.

Do you feel that the Department's current science and technology investment strategy strikes the appropriate balance between funding innovative, disruptive

technologies and addressing near term operational needs and military requirements?

A strong S&T program is required to provide options for responding to a full range of military challenges both today, and into the future. DoD must continue to invest broadly in defense-relevant technologies and strive for a balance between high-risk/high-payoff, disruptive technologies, and technologies that address near term operational needs. I know that the Department is making investments in both these areas and, if confirmed, I will make an assessment of the balance.

Basic Research

A 2005 National Academy of Sciences study entitled *Assessment of Department of Defense Basic Research* noted that "the need for discovery from basic research does not end once a specific use is identified, but continues through applied research, development, and operations stages. ... DOD should view basic research, applied research, and development as continuing activities occurring in parallel, with numerous supporting connections throughout the process. ... Senior DOD management should support long-term exploration and discovery and communicate this understanding to its research managers."

Given the continuing nature of basic research and the broad implications and applications of discovery-focused and innovation-focused sciences, what criteria would you use, if confirmed, to measure the success of these programs and investments?

The potential rewards of basic research are generally long-term, and hence short-term quantitative metrics are difficult to apply effectively. If confirmed, I will evaluate success on the quality of the researchers and the research we are able to attract to our programs, and how DoD-sponsored research guides, influences, and is influenced by the scientific and engineering fields in which it invests. With the input of the universities, laboratories, and independent expert panels, I expect to establish guidance in scientific priorities for the Department's basic research activities.

If confirmed, how would you determine whether there is an adequate investment in basic research to develop the capabilities the Department will need in 2020?

It is not easy to accurately gauge the adequacy of investment in basic research, given the uncertainty of the results and its long term nature. However, because of basic research's amply demonstrated transformative potential in the Nation's warfighting capabilities, I believe that the DoD should remain a major contributor to the Nation's basic science activities. This is consistent with the stated policy of Secretary Gates to strengthen Defense Basic Research.

The National Academies study also found that "A recent trend in basic research emphasis within the Department of Defense has led to a reduced effort in unfettered

exploration, which historically has been a critical enabler of the most important breakthroughs in military capabilities."

If confirmed, what steps, if any, will you take to address this concern?

If confirmed, I will direct DUSD(LABS) to study and report to me on the state of scientific exploration under DoD basic research, and if the flexibility of scientific research has been unduly hampered.

The JASON 2008 study "S&T for National Security" observed that:

- **"DOD is not adhering to its own definition of basic research in its use of 6.1 funds"**
- **"Basic research funding is not exploited to seed inventions and discoveries that can shape the future…"**
- **"The portfolio balance of DOD basic research is generally not critically reviewed by independent, technically knowledgeable individuals"**

Have you reviewed the findings of the JASON study?

I have read the JASON study, but if confirmed, I plan to review it in detail against the broad context of basic research across the Department.

If confirmed, what steps, if any, will you take to address the concerns raised by the JASON review?

I believe in the importance of basic research to the DoD mission and if confirmed, I will carefully review the JASON study and other related studies to assess the program.

Chief Technology Officer

If confirmed, as Director of Defense Research and Engineering, you will be the Chief Technology Officer (CTO) of the Department of Defense.

What do you see as the role of the CTO of the Department of Defense?

The role of the Chief Technology Officer of the Department is defined in the DDR&E charter. The charter defines the role of the DDR&E as the Principal Staff Assistant to the Under Secretary of Defense (AT&L) and the Secretary on all technical matters. The DDR&E should provide guidance to shape the DoD S&T program and to develop technology options for the Department. The CTO should also contribute significantly to ensuring that major acquisition programs are conducted with acceptable technological risk.

What lessons have you learned as CTO of MIT Lincoln Laboratory that will enhance your ability to serve as CTO of DOD?

My lessons as the CTO at Lincoln Lab highlighted the importance of building partnerships and alliances. If confirmed, I will attempt to apply my lessons learned to the DoD.

What authorities do you currently possess as CTO of MIT Lincoln Laboratory that you find most useful in exercising you responsibilities as CTO?

My open access to the MIT leadership and the tremendous collaboration across the MIT technical community has opened new technical frontiers and rapidly transitioned key ideas from research to end use.

Do you believe you will have those same authorities if confirmed as Director of Defense Research and Engineering?

Yes, I believe the same authorities will exist as Director of Defense Research and Engineering.

Technology Readiness Assessment Process

Have you participated in or observed the development of Technology Readiness Assessments to support Milestone Decisions for defense acquisition programs?

I have not yet had the opportunity to participate or observe any Technology Readiness Assessments (TRAs).

What is your assessment of the value, strengths, and weaknesses of the current process?

My current understanding of TRAs is that they offer substantial value from cost, schedule, and performance perspectives by causing the DoD acquisition process to confront technology maturity issues in a rigorous and timely fashion. Among the greatest strengths of the DoD TRA process are its focus on independent review teams of technology experts, and the requirement for hard evidence to prove technology readiness ratings. Another strength of the process is standardization throughout the Military Components, through the DoD Technology Readiness Assessment Deskbook and frequent DoD wide training and workshops. I believe, consistent with the Weapons Systems Acquisition Reform Act of 2009, that the process could be strengthened by adding greater emphasis on system integration issues.

Would you recommend any changes to the processes used for the assessment of technological maturity and integration risk of critical technology elements?

Before recommending any changes to the current process, I believe I would need to observe and participate (as a reviewer) in the DoD TRA process. If confirmed, I intend to do so.

Are you satisfied that the Director of Defense Research and Engineering is properly staffed and resourced to support decision makers in complying with the technology certification and assessment requirements that are its responsibility?

From my current vantage point, I am unable to make this determination.

What changes, if any, would you anticipate making , if confirmed, in this process as a result of the enactment of the Weapon Systems Acquisition Reform Act of 2009?

If confirmed, I will carefully consider changes that may be needed. I believe it is likely that the requirement to conduct "periodic" reviews of technology maturity, the addition of integration risk, and the requirement to conduct assessments in consultation with the director of developmental test and evaluation will lead to changes in the current process.

Coordination of Defense S&T with Other Agencies

Do you believe the mechanisms of coordination between federal civilian agencies and the Department are adequate to ensure that the military can best leverage the advances of agencies such as:

- **National Science Foundation on defense needs for basic science, especially in social sciences?**

From my current vantage point, I am unable to definitively make this determination, but, adequate coordination and collaboration processes appear to exist. If confirmed, I will ensure that dialogue with the Department and the National Science Foundation is open and transparent.

- **National Aeronautics and Space Administration on hypersonics and other space research and the viability and availability of testing facilities?**

From my current vantage point, I am unable to definitively make this determination, but adequate coordination and collaboration processes appear to exist. If confirmed, I will ensure that dialogue with the Department and the National Aeronautics and Space Administration is open and transparent.

- **National Institutes of Health on areas in which military medical research and vaccine development overlap with civilian medical needs?**

From my current vantage point, I am unable to definitively make this determination, but adequate coordination and collaboration processes appear to exist. If confirmed, I will ensure that dialogue with the Department and the National Institutes of Health is open and transparent.

- **Intelligence Community in setting defense research priorities to prepare for future threat environments?**

From my current vantage point, I am unable to definitively make this determination, but adequate coordination and collaboration processes appear to exist. If confirmed, I will ensure that dialogue with the Department and the Intelligence Community is open and transparent.

- **Department of Homeland Security on homeland defense and national security-related science?**

From my current vantage point, I am unable to definitively make this determination, but adequate coordination and collaboration processes appear to exist. If confirmed, I will ensure that dialogue with the Department and Department of Homeland Security is open and transparent.

If confirmed, how would you work with other federal agencies and the Office of Science and Technology Policy to improve coordination?

From my current vantage point, I am unable to definitively make this determination, but adequate coordination and collaboration processes appear to exist. If confirmed, I will ensure that dialogue with other federal agencies and the Office of Science and Technology Policy is open and transparent.

Technology Strategy

What weaknesses, if any, do you see in the current Defense S&T strategic planning process?

I do not have enough insight into the internal DoD Strategic planning process to judge this activity.

What do you believe are the key attributes for a good strategic plan that can be effectively utilized for programming and budgeting purposes?

I believe a good strategic plan should be simple, clear, realistic and widely disseminated. Additionally, a strategic plan should be linked to higher goals and provide guidance for subordinate organizations.

If confirmed, how would you work to ensure that strategic plans are utilized during the budget planning and programming process?

Before recommending how I would do this, I need to participate in the DoD budget planning and programming process and will do so if confirmed.

Technology Transition

The Department's efforts to quickly transition technologies to the war fighter have yielded important results in the last few years. The Department's fiscal year 2010 budget proposes increases across a spectrum of technology transition programs. Challenges remain, however, in successfully transitioning new technologies into existing programs of record, fielded systems, and major weapons systems and platforms.

What challenges exist in technology transition within the Department?

Based on my experience, lack of funding flexibility and the extended timelines of DoD requirements and budget processes are challenges to technology transition. Successful transition requires an appropriately mature technology, a user need, an insertion window in the program of record, and budgeted resources for implementation. This alignment is hard to achieve and maintain, and the gap between S&T and acquisition often needs bridge funding in the execution year.

What would you do, if confirmed, to address these challenges?

If confirmed, I will review the mechanisms and processes that are in place and determine if improvements are needed.

What is the role of the Director of Defense Research and Engineering in facilitating communication between technical communities, acquisition personnel, and end users to speed technology transition?

I believe one key factor to successful technology transition is early engagement. If confirmed, I will foster relationships among these communities by understanding the needs of the warfighter and by interpreting those needs in a manner that allows the acquisition system to respond.

Do you believe that we need to change the manner in which we fund technology transition in the Department of Defense? If so, what changes would you recommend?

I am aware that the 2009 National Defense Authorization Act mandates the Department to develop an assessment of various technology transition programs within the Department of Defense, and that an assessment is being performed by the DDR&E staff. If confirmed, I will ensure that the assessment goals meet the intent of the language, and that appropriate action is taken to balance our technology transition portfolio with the needs of the warfighter.

Systems Engineering and Prototyping

Do you feel that the Department of Defense has sufficient systems engineering expertise in its current workforce or contractor base?

I am aware that some aspects of prior acquisition reform initiatives may have removed technical capability from the government workforce and delegated them to the contractor base.

What changes do you anticipate will be made in the Department's systems engineering organization and practices as a result of the enactment of the Weapon Systems Acquisition Reform Act of 2009?

The Weapon Systems Acquisition Reform Act of 2009 identifies a key role for systems engineering in the acquisition process. I believe there will be opportunities to strengthen systems engineering in response to this Act.

What is the value of competitive prototyping in increasing the success of DOD acquisition efforts?

I regard prototyping as a critical path to enhanced technology development and reduced technical risk. Through competitive prototyping we should be able to achieve more predictable cost, schedule and performance outcomes leading to increased success with our DoD acquisition programs.

What impact do you expect the Weapon Systems Acquisition Reform Act of 2009 to have on competitive prototyping efforts by the Department of Defense?

I expect the Weapon Systems Acquisition Reform Act of 2009 to have a positive impact by adding significant authority to the DoD's competitive prototyping policy. The competitive prototyping clarification, combined with the systems engineering emphasis provided by the legislation, offer the opportunity to identify, scope, resource and execute the pre-milestone B activities collaboratively between the requirements and the acquisition communities to develop the data required to fully inform the milestone B.

If confirmed, how will you work to increase the amount of systems engineering projects and competitive prototyping efforts that are undertaken by the Department of Defense and its contractor base?

If confirmed, I will facilitate communication between the science and technology community and the systems engineering community to engage with programs early in the acquisition lifecycle, and work to ensure maturity and integration issues of critical technologies are fully addressed.

Venture Capital Strategies

In recent years, some components of the Department of Defense have attempted to follow the lead of the intelligence community by using venture capital firms to make investments in developing technologies.

What role do you believe that venture capital firms should play in DOD's investments in developing technologies, including in the Small Business Innovation Research program?

Venture capital firms can provide access to innovative companies that might not normally gain exposure to DoD. If confirmed, I will explore opportunities within DoD guidelines to capitalize on the ability of venture capital firms to reach companies to identify technology solutions of interest to DoD within legal authorities.

What advantages and disadvantages do you see in the use of venture capital strategies?

The advantage of venture capital strategies is that they provide windows to companies that are not traditional DoD partners. The disadvantage to venture capital strategies is that small firms are not often fully cognizant of government practices.

When DOD does decide to use venture capital strategies, what steps do you believe the Department should take to ensure that DOD funds are invested in technologies and companies that properly reflect national defense priorities, avoid the potential for conflicts of interest by industry partners, and ensure that the Department's investments are not diluted?

I believe before investing in a venture capital opportunity, the project should be reviewed to ensure it will meet a military requirement and is not duplicating the work that is already being supported through other programs. The review should include the full participation of interested parties and potential users within DoD.

What other strategies do you intend to employ, if confirmed, to ensure that the nation's most innovative companies work on Department of Defense research and engineering programs?

If confirmed, I will conduct a review of existing mechanisms that allow innovative companies to work with DoD and identify any obstacles that prevent innovative companies from working with DoD.

International Research Cooperation

In your view, how should increased globalization of defense technology affect DOD's research and technology development and investment strategy?

The increased globalization of defense technology impacts the DoD on several levels. First, the intellectual capital advantage the U.S. once enjoyed is being eroded as other nations' R&D investments increase. The U.S. no longer enjoys a monopoly in some technologies. Finally, the non-U.S. science and engineering labor force continues to expand at a greater rate than that of the U.S. Because technology is becoming a global

commodity, I believe the Department should look to expand, within policy guidelines, international S&T awareness. If confirmed, I will work towards that goal.

What is your assessment of the value of cooperative research and development programs with international partners?

From my current vantage point, I understand the value of cooperative research and development with international partners. This value needs to be balanced with national security factors to maximize research and development output without security risk. If confirmed, I will review international cooperative agreements in this light.

In your view, what are the obstacles to more effective international cooperation, and, if confirmed, how would you address those obstacles?

From my current vantage point, I am unable to assess obstacles to more effective international cooperation, but if confirmed, I will work hard to balance the benefits of international cooperation, which I believe exist, with the risks, and take appropriate action.

How will increased international technology cooperation affect our domestic defense industrial base?

My experience has shown me that a case-by-case assessment of the impact of any proposed international technology cooperation includes the impact on the domestic industrial base.

How should DOD monitor and assess the research capabilities of our global partners and competitors, and of the global commercial sector?

I am aware all of the Services have offices around the globe to assess the research capabilities of our global partners. Since global technology is important, if confirmed, I will examine the output of these offices and take steps to strengthen their capability if needed.

Test and Evaluation

What are your views on the adequacy and effectiveness of the Department's development and operational test and evaluation activities?

From my current vantage point, I am not able to comprehensively assess the adequacy of the Department's developmental or operational test and evaluation activities. I do know that a properly defined test plan should improve technology development, and, if confirmed, I would be responsible as Chief Technology Officer for demonstrations, and would review test plans accordingly.

What changes do you anticipate will be made in the Department's developmental testing organization and capabilities as a result of the enactment of the Weapon Systems Acquisition Reform Act of 2009?

From my reading of the Weapons Systems Acquisition Reform Act of 2009, I understand that the statute requires creation of a position entitled Director of Developmental Test and Evaluation (DT&E). Since such a position does not currently exist, I believe the new statute will drive change to DT&E.

What modifications would you recommend to the test and evaluation processes in the Department of Defense to more efficiently and quickly develop and deliver operationally effective and suitable technologies to the warfighter?

I believe it is important that equipment and technology acquired by the Department be subject to robust Systems Engineering, comprehensive Developmental Test and Evaluation, and realistic Operational Test and Evaluation. If confirmed, I would enforce the provision of the Weapons Systems Acquisition Reform Act of 2009 that addresses the technology maturity issue through the activities of the Director of Defense Research and Engineering, in consultation with the Director of Developmental Test and Evaluation.

Small Business Issues

If confirmed, how would you work to ensure that the Small Business Innovation Research (SBIR) program serves a useful purpose in meeting the Department's research goals?

The DoD SBIR program represents a substantial augmentation to the Department's core tech base research funds. SBIR research topics and contracts should support DoD priority needs, and be complementary to core research investments. If confirmed, I will review the current DDR&E process for coordinating the SBIR program and will work to ensure that this process yields a valuable contribution to the Department's research investments.

What guidance or direction do you consider necessary regarding transition of the research results of SBIR programs to major weapons systems and equipment?

If confirmed, I will work with the DoD Office of Small Business Programs, and other appropriate offices, to develop mechanisms to improve the visibility of SBIR technologies to major weapons programs, as well as with the Services SBIR program managers to make sure the SBIR research is as relevant as possible.

What emphasis would you place, if confirmed, on participation by the acquisition community in setting research priorities for the SBIR and in accepting new solutions into existing programs of record?

I do not know the current process for balancing SBIR priorities, but I believe that acquisition programs should be a source of SBIR research topics, and should be an interested and willing customer for SBIR products. Topics for new SBIR competitions should be informed by acquisition community needs and shortcomings. If confirmed, I will encourage Service Acquisition Executives to play a vigorous role in developing new SBIR research topics, and in fostering adoption of mature SBIR technologies into programs of record.

In your judgment, are modifications needed to the Department's SBIR program to ensure it meets the Department's goals and is updated to support research costs of the small business community?

In general, I believe that the Department is best served by an SBIR program that enables contracts in each SBIR phase to be properly scaled for anticipated costs of the intended research, and that the size limit on SBIR-eligible firms should be strictly applied so as to encourage maximum participation by small firms. If confirmed, I will examine the SBIR program in more detail to determine if modifications are needed.

Defense Laboratories

What is your overall assessment as to the technical capabilities and quality of Defense laboratories relative to their Department of Energy, FFRDC, industry, academic and foreign peers?

I believe that a robust and rigorous science and technology program, which includes high-performing DoD laboratories, is important to our national security. The DoD laboratories provide a unique and dedicated array of capabilities for the military. The DoD labs, working in partnership with other agency and university laboratories, have historically played a major role in our military's technology superiority. However, based on recent assessments, there may be a need for improvement. If confirmed, I will place a priority on examining our Defense laboratories and workforce. We will study comparisons between the Department of Energy national laboratories, NASA research centers, the National Institute of Standards and Technology, as well as universities and industry. If necessary improvements are identified, a plan will be developed for their implementation.

What are your views on the most effective management approach for personnel at these facilities?

The ability of the DoD laboratories to support the Department's missions through research and technology development is important for our national security. The keys to a productive laboratory are its workforce and providing a state-of-the-art technical environment in which scientists and engineers have the opportunity to develop innovative concepts. Providing laboratory directors flexibility in their ability to hire, train, and retain a talented technical workforce and providing them with facilities conducive to scientific discovery are essential. If confirmed, I will study which management practices have yielded good results and work towards expanding their use.

A review of defense laboratories operations shows various deficits in personnel management, infrastructure renewal, physical plant recapitalization rate, support services adequacy, etc. Some analyses have indicated that these deficiencies result from excessive centralized control.

Do you support significantly increased delegation of operating authority to the lab director?

I believe in aligning responsibility at the lowest possible level needed to execute. Consequently, I support, in principle, delegating increased operating authority to laboratory directors. If confirmed, I will direct the Deputy Under Secretary for Laboratories and Basic Sciences to review personnel management, infrastructure recapitalization, and other lab issues, and provide recommendations to address identified problems. I will then work towards developing the necessary authorities for lab directors based upon these recommendations.

If confirmed, what steps, if any, will you take to improve the quality, technical capabilities, and mission performance of the Defense laboratories?

The first step to take towards improving any enterprise is to assess objectively the current state of the enterprise. Before delineating specific steps to take to improve the DoD labs, if confirmed, I would take steps to fairly assess their quality, technical capabilities, and so forth. In general, I believe the labs are a critical element in addressing identified warfighting capability needs, both current and future, as well as developing technology to meet potential threats in the future. I believe it is important to preserve this capability.

Would you support transitioning certain laboratory capabilities into FFRDCs or Government Owned-Contractor Operated facilities?

If confirmed, I will ask the Deputy Under Secretary of Laboratories and Basic Sciences to study these options, and provide recommendations.

Laboratory Personnel Management

The Department's research and development laboratories perform unique functions in serving national security missions and do not readily fit into the general operational management structure. The JASON study observed that "civilian career paths in the DOD research labs and program management are not competitive to other opportunities in attracting outstanding young scientists and retaining the best people." Congress has enacted legislation granting special authorities to the Secretary of Defense for flexible management and personnel demonstration experiments at the laboratories and has exempted the demonstration laboratories from inclusion in the National Security Personnel System until 2012.

Would you support making the laboratories' exemption from NSPS permanent and enabling them to make full use of the flexibilities inherent in the laboratory demonstration program's enabling statutes?

Based on recent news articles, I believe the Department of Defense is currently assessing the implementation of NSPS and is also assessing flexible hiring authorities. The result of that assessment would be a factor in any decisions about further implementation of lab management.

What particular workforce challenges does the Office of the Director of Defense Research and Engineering have?

A technically skilled and competent workforce is essential to the success of technology development and acquisition programs. Attracting, hiring, training, and retaining a technical workforce is a pressing challenge facing many organizations. If confirmed, I would take steps to attract and retain the best possible personnel. Such steps include but are not limited to ensuring effective outreach programs to students, offering competitive salaries to employees, training personnel to ensure they maintain their skills, and providing an environment which stimulates innovative thinking and risk taking.

If confirmed, how will you go about making the resource assessment required by section 104(b) of the Weapon Systems Acquisition Reform Act of 2009?

If confirmed, I will ask my Director of Plans and Programs to work with the Deputy Under Secretary for Laboratories and Basic Sciences, the Director of the Test Resource Management Center, and the Deputy Under Secretary of Defense for Acquisition and Technology to develop an analytical estimate of the resources required.

Technical and Acquisition Workforce Issues

In your view, does the Department have adequate technical expertise within the government workforce to execute its designated acquisition and technical development missions?

Based on my current vantage point, any assessment of the adequacy of the DoD technical workforce would be an opinion, not an analytical assessment. Because of the importance of people to the technical product, I believe such an assessment needs to be based on hard facts and data. If confirmed, I would require the DDR&E staff to develop the data needed for an analytical assessment before providing an opinion or taking any actions.

What efforts will you undertake, if confirmed, to improve the technical capabilities of DOD in critical areas, such as systems engineering, information assurance, social and cultural sciences, and software engineering?

I am aware that the DDR&E is responsible for the overall Department's Science, Technology, Engineering and Mathematics (STEM) education oversight. If confirmed, I would first review existing programs to assess adequacy of the technical workforce, then

seek to adjust the programs designed to develop new scientists and engineers to match the supply to the demand.

Defense Science Board Study on the Roles and Authorities of the Director of Defense Research and Engineering

Have you reviewed the report of the 2005 Defense Science Board Task Force on the Roles and Authorities of the Director of Defense Research and Engineering?

I have read the 2005 Defense Science Board Task Force on the Roles and Authorities of the Director of Defense Research and Engineering.

If so, what are your views of this report and, if confirmed, how would you plan to utilize the findings of the Defense Science Board Task Force?

If confirmed, I will review the report in detail to determine which recommendations remain relevant, and work with leadership of the Department of Defense on determining what findings and recommendations should be implemented and how best to implement these recommendations.

Defense Advanced Research Projects Agency

What is your view of the appropriate relationship between the Director of Defense Research and Engineering and the Director of DARPA?

The Director of DARPA reports to the DDR&E per DoD Directive 5134 and I have no reason to believe that changes should be made to this relationship.

What do you believe is the proper research mission for DARPA?

DARPA has a long and storied history of being an engine of innovation for the U.S. DARPA's ability in being able to tackle some of the most difficult problems facing the DoD, and apply very innovative solutions is unique. I believe the proper role for DARPA is to conduct the high-risk, high-payoff research for the Department, and to share that work with the Services and others within the government.

What adjustments do you expect to make, if confirmed, to the current style of DARPA research program management and investment strategy?

If confirmed, I intend to work closely with DARPA, as well as the Services, to provide a balanced technology approach for the Department. If confirmed, I will closely examine the current DARPA and Service management processes to determine if adjustments are required, and if they are, how to provide the best possible, but balanced product to meet current and future needs of DoD.

What do you believe are the key characteristics of an effective DARPA director?

I believe the DARPA Director should have the skills to effectively communicate the value of the DARPA product, have an ability to build teams outside of DARPA, and finally, be infused with a spirit that does not accept that something cannot be done.

What, in your view, is the appropriate relationship between DARPA and the Service S&T programs?

The appropriate relationship between DARPA and the Services should be complementary. DARPA pushes the far side to develop the big leap-ahead advances, while the Service S&T programs draw upon these technological advancements to develop products. Any S&T program that does not balance these two forces is, I believe, sub-optimal. If confirmed, I will work to maintain this balance.

What, in your view, is the appropriate relationship between DARPA and the Service laboratories?

The laboratories and DARPA are partners in developing technology solutions for the warfighter.

Science, Technology, Engineering and Mathematics (STEM) Education

Do you believe that DOD specifically and the nation as a whole is a facing a crisis in STEM education?

Based on recent blue ribbon studies and my own experience, I believe both the DoD and the Nation have a challenge in STEM education, and our ability to educate, train, and retain students and workers in the STEM fields. This is a particular challenge for DoD, which manages a large part of the federal science and engineering workforce and 35,000 at the DoD laboratories.

In your view, how will this affect DOD's ability to prosecute its missions?

The ability of the Department in carrying its missions depends on an educated and talented STEM workforce; consequently, if confirmed, maintaining STEM personnel will be important to me.

What role do you think DOD should play in supporting STEM education?

I believe the Department should be actively engaged at all levels across the Science, Technology, Engineering and Mathematics education continuum—pre-college through graduate--and, more importantly, work with the Office of Science and Technology Policy, the National Science Foundation and other Federal components involved in national security, to generate a "whole of government" approach to workforce development.

Congressional Oversight

In order to exercise its legislative and oversight responsibilities, it is important that this Committee and other appropriate committees of the Congress are able to receive testimony, briefings, and other communications of information.
Do you agree, if confirmed for this high position, to appear before this Committee and other appropriate committees of the Congress?

Yes

Do you agree, if confirmed, to appear before this Committee, or designated members of this Committee, and provide information, subject to appropriate and necessary security protection, with respect to your responsibilities as the Director of Defense Research and Engineering?

Yes

Do you agree to ensure that testimony, briefings and other communications of information are provided to this Committee and its staff and other appropriate Committees?

Yes

Do you agree to provide documents, including copies of electronic forms of communication, in a timely manner when requested by a duly constituted Committee, or to consult with the Committee regarding the basis for any good faith delay or denial in providing such documents?

Yes